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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,685	07/27/2001	Junsong Li	SC11312TS	9840

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EXAMINER

HA, DAC V

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 05/12/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/916,685

Applicant(s)

LI ET AL.

Examiner

Dac V. Ha

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4.6</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 1-8, 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Anvari et al. (US 5,203,025) (hereinafter Anvari).

Regarding claim 1, Anvari discloses a Selection Circuit In A Space Diversity Reception System For A Mobile Receiver, which teaches the following claimed subject matter.

"a higher frequency unit having a first input for receiving a first signal from a first sensor and having a second input for receiving a second signal from a second sensor, wherein for a first selection state, the first signal and the second signal represent a same information value;" (Figure 1, all elements before elements 18, 20; Abstract; Col. 1, lines 25-30; Col. 2, lines 52-66; Col. 3, line 66 to Col. 4, line 3)

In Anvari's patent, the combination of all elements before elements 18, 20 teaches "a higher frequency unit", wherein elements 2 and 4 teach "a first sensor" and "a second sensor", respectively. The signals received by elements 2 and 4 teach "a first signal" and "a second signal", respectively. The signals from elements 2, 4 going to the system shown in Figure 1 teach "a first input" and "a second input", respectively. Claim 1 recites, "for a first selection state, the first signal and the second signal represent a

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same information". Anvari teaches a diversity system in which a number of different transmission paths carrying the same information (Col. 1, lines 25-28). The element 2 is used for both transmission and reception, and element 4 is used only for reception (Col. 2, lines 54-56). Thus, in Anvari's patent, the state when both elements 2 and 4 are for reception teaches "for a first selection state, the first signal and the second signal represent a same information".

"a baseband unit, coupled to said higher frequency unit, said baseband unit having at least one bypass signal and at least one output, said bypass signal selecting whether the output is a function of the first signal combined with the second signal based on at least the first selection state" (Figure 1, the combination of elements after the elements 10 and 16; Abstract; Col. 2, lines 14-34; Col. 3, lines 2-39)

The combination of all elements after elements 10, 16 teaches "a baseband unit". The output of the control unit (element 26) teaches the "bypass signal", where it is utilized to determine whether and how to combine the "first signal" and the "second signal" (Col. 3, lines 10-11).

Even though Anvari does not teach the claimed subject matter "having a first output for providing a first baseband signal corresponding the first radio frequency signal, and having ... second radio frequency signal" explicitly, a person of ordinary skilled in the art would have understood that the received radio frequency signals must have been converted to base band signal eventually before providing to the user as useful information. This conversion to base band signal could have happened any where after receiving the RF signal and before providing the information to user as

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optional. Therefore, the claimed subject matter "having a first output ... second radio frequency signal" would have been obvious to one skilled in the art.

Regarding claim 2, Anvari teaches the claimed subject matter "a radio frequency unit ... intermediate frequency signal corresponding to the second radio frequency signal" in Figure 1, elements 10, 16, wherein the RF signals are converted into IF signals. Further, Anvari suggests the teaching of the claimed subject matter "an intermediate frequency unit ... baseband signal" in Figure 1, element 38, wherein Anvari implies the signals are demodulated and converted to baseband for further processing.

Regarding claim 3, Anvari further teaches the claimed subject matter "wherein said baseband unit comprises: a filter, coupled to said higher frequency unit" in Figure 1, elements 25a, 25b.

Regarding claim 4, Anvari further teaches the claimed subject matter "wherein said baseband unit further comprises: a channel processing unit; coupled to an output of said filter, said channel processing unit generating the bypass signal" in Figure 1, element 26; Col. 3, lines 9-11, 15-19, where element 26 teaches "a channel processing unit".

Regarding claim 5, Anvari further teaches the claimed subject matter "wherein said baseband unit further comprises: a demodulator; coupled to said channel processing unit" in Figure 1, element 38.

Regarding claim 6, Anvari further teaches the claimed subject matter "wherein said channel processing unit selectively combines the first baseband signal and the

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second baseband signal" in that element 26 determines whether and how to combine the received signals (Col. 3, lines 9-11).

Regarding claim 7, Anvari further teaches the claimed subject matter "wherein said higher frequency unit comprises: a radio frequency unit having a first input for receiving the first radio frequency signal from the first sensor, having a second input for receiving the second radio frequency signal from the second sensor, and having an output" in Figure 1, elements 8, 14, wherein elements 8, 14 teach "a radio frequency unit" and the inputs of elements 8, 14 teach "a first input" and "a second input" respectively. Also, at least one of the outputs of elements 8 or 14 teaches "an output".

Regarding claim 8, Anvari further teaches the claimed subject matter "wherein said higher frequency unit further comprises: an intermediate frequency unit; having an input coupled to the radio frequency unit for receiving an analog signal from the radio frequency unit" in Figure 1, elements 10, 16; Col. 2, lines 59-66.

3. **Claims 9-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Anvari in view of Schilling (US 5,659,572).

Regarding claim 9, Anvari teaches all the claimed subject matter in claim 9, as applied to claim 1 above, except for the claimed subject matter "wherein said higher frequency unit provides information to said baseband unit in digital rather than analog form".

The attention is now directed to Schilling's patent, which teaches claimed subject matter "wherein said higher frequency unit provides information to said baseband unit in digital rather than analog form" as followed. Schilling discloses a system and method

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for dealing with spatial diversity (Col. 1, lines 30, 36). Further, Schilling teaches the received signals from "a higher frequency unit" (Figure 3, elements 21, 22) are converted to digital form (Figure 3, elements 23, 24) before providing the signals to the "baseband unit" (Figure 3, elements 40, and Demodulation Circuit).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of converting the received signal into digital form before utilizing the signal for further processing, as taught by Schilling, into Anvari's patent to provide a receiving system with a digital "baseband unit". The benefit is to provide more reliable and less cost system since digital processing has become the technique of choice in communication system over the past 10 years, providing more products and devices.

Regarding claim 20, see claim 9 above.

Regarding claim 10, the combination of Anvari and Schilling patents, more particularly, Schilling's patent further teaches that "all information provided by said higher frequency unit" (Figure 3, elements 21, 22) are converted to digital form (Figure 3, elements 23, 24) before providing the information to the "baseband unit" (Figure 3, elements 40, and Demodulation Circuit).

Regarding claim 11, the combination of Anvari and Schilling patents, more particularly, Anvari's patent further teaches the claimed subject matter "wherein the first sensor is a first antennae and wherein the second sensor is a second antennae" in Figure 1, elements 2, 4; Col. 2, lines 53-54.

Regarding claim 15, Anvari discloses a Selection Circuit In A Space Diversity Reception System For A Mobile Receiver, which teaches the following.

“first means for receiving a first signal from a first sensor and for receiving a second signal from a second sensor, wherein the first signal and the second signal represent a same information value for a first selection state;” (Figure 1, all elements before elements 18, 20; Abstract; Col. 1, lines 25-30; Col. 2, lines 52-66; Col. 3, line 66 to Col. 4, line 3);

In Anvari 's patent, the combination of all elements before elements 18, 20 teaches “a first means”, wherein elements 2 and 4 teach “a first sensor” and “a second sensor”, respectively. The signals received by elements 2 and 4 teach “a first signal” and “a second signal”, respectively. Claim 15 recites “the first signal and the second signal represent a same information value for a first selection state”. Anvari teaches a diversity system in which, a number of different transmission paths carrying the same information (Col. 1, lines 25-28). The element 2 is used for both transmission and reception, and element 4 is used only for reception (Col. 2, lines 54-56). Thus, in Anvari's patent, the state, when both elements 2 and 4 are for reception, teaches “the first signal and the second signal represent a same information value for a first selection state”.

“baseband means for generating a bypass signal and an output, said baseband means being coupled to said first means for receiving” “information relating to at least one of the first and second signals, wherein said bypass signal selects, based upon at least the first selection state, whether the output of the baseband means is a

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function of the first signal combined with the second signal" (Figure 1, the combination of elements after the elements 10 and 16; Abstract; Col. 2, lines 14-34; Col. 3, lines 2-39).

The combination of all elements after elements 10, 16 teaches "baseband means". The output of the control unit (element 26) teaches the "bypass signal", wherein, when both the elements 2 and 4 are for reception, the output from the element 26 is utilized to determine whether and how to combine the receives signals (Col. 3, lines 10-11), thus, teach "said bypass signal selects, based upon at least the first selection state, whether the output of the baseband means is a function of the first signal combined with the second signal".

Anvari's patent differs from the claimed invention in that it does not teach the claimed subject matter "baseband means being coupled to said first means for receiving digital information relating to at least one of the first and second signals". The attention is now directed to Schilling's patent. Schilling discloses a system and method for dealing with spatial diversity (Col. 1, lines 30, 36). Further, Schilling teaches the received signals from the "first means" (Figure 3, elements 21, 22) are converted to digital form (Figure 3, elements 23, 24) before providing the "digital information" to the "baseband means" (Figure 3, elements 40, and Demodulation Circuit).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the teaching of converting the received signal into digital form before utilizing the "digital information" for further processing in the "baseband means", as taught by Schilling, into Anvari's patent to provide a receiving

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system with a digital "baseband means". The benefit is to provide a more reliable and less cost system since digital processing has become the technique of choice in communication system over the past 10 years, providing more products and devices.

4. **Claims 12-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Anvari in view of Dent (US 5,566,168).

Regarding claim 12, Anvari teaches all the claimed subject matter in claim 12, as applied to claim 1 above, except for the claimed subject matter "wherein said baseband unit comprises: an echo canceller".

The attention is now directed to Dent's patent, which suggests the teaching of the claimed subject matter "wherein said baseband unit comprises: an echo canceller" as followed. Dent discloses a radio access method in which, space diversity reception is used to improve range and combat fading (Col. 11, lines 36-39). In multi-path environment, the received signal is composed of a directly received signal and a plurality of delayed multi-path signals created by reflection from object(s) within the propagation environment. The delayed signals are commonly referred to as "multi-path interference", "multi-path fading" or "multi-path echo". Dent teaches that, when combining signals from a plurality of antennas in the demodulation (Col. 11, lines 39-41), echo canceling can be involved in the demodulation stage to mitigate the effects of multi-path propagation (Col. 8, lines 18-20). That is, Dent suggests the teaching of the claimed subject matter "wherein said baseband unit comprises: an echo canceller".

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the use of echo canceling for mitigating the

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effects of multi-path propagation, as taught by Dent, into "baseband unit" of the diversity system taught by Anvari to cancel the multi-path echo. The benefit is that Anvari's patent deals with space diversity system to combat multipath fading (Col. 1, line 64; Col. 2, line 1), and by incorporating the multi-path echo canceling feature, the diversity system would provide cleaner signal. As a result, the signal quality of the system is improved.

Regarding claim 13, the combination of Anvari and Dent patents, more particularly Dent's patent, further suggests the teaching of the claimed subject matter "wherein said echo canceller performs echo cancellation when diversity combining is used in said baseband unit" as followed. As indicated above in claim 12, Dent teaches that in space diversity, echo canceling is desired. The space diversity system processes the signal combined from a plurality of antennas (Col. 11, lines 36-39), and in this signal combining process, echo canceling is involved (Col. 8, lines 18-20). That is, when combining the signals from a plurality of antennas (different paths), it is desired to cancel the effect of multi-path echo, so that the signal quality is improved.

5. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Anvari in view of Dent as applied to claim 13 above, and further in view of Reese et al. (US 5,631,958) (hereinafter Reese).

Regarding claim 14, the combination of Anvari and Dent patents teaches all the claimed subject matter in claim 14, as applied to claim 13 above, except for the claimed subject matter "wherein use of echo cancellation is selectable".

The attention is now directed to Reese's patent. Reese discloses a system, which teaches the "use of echo cancellation is selectable" by selectively enabling and disabling the echo cancellation (Abstract; Col. 2, lines 20-22).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the "use of echo cancellation is selectable" taught by Reese, into the echo canceling portion of the combination of the Anvari and Dent patents to provide the echo canceller with capability of selectively enabling or disabling the echo cancellation, thus providing the benefit of reducing power consumption when the echo cancellation is not needed.

6. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Anvari in view of Schilling as applied to claim 15 above, and further in view of Dent.

Regarding claim 16, the combination of Anvari and Schilling patents teaches all the claimed subject matter in claim 16, as applied to claim 15 above, except for the claimed subject matter "wherein said baseband unit comprises: an echo canceller".

The attention is now directed to Dent's patent, which suggests the teaching of the claimed subject matter "wherein said baseband unit comprises: an echo canceller" as followed. Dent discloses a radio access method in which, space diversity reception is used to improve range and combat fading (Col. 11, lines 36-39). In multi-path environment, the received signal is composed of a directly received signal and a plurality of delayed multi-path signals created by reflection from object(s) within the propagation environment. The delayed signals are commonly referred to as "multi-path interference" "multi-path fading" or "multi-path echo". Dent teaches that, when

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combining signals from a plurality of antennas in the demodulation (Col. 11, lines 39-41), echo canceling can be involved in the demodulation stage to mitigate the effects of multi-path propagation (Col. 8, lines 18-20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to incorporate the use of echo canceling for mitigating the effects of multi-path propagation as taught by Dent into "baseband unit" of the diversity system taught by the aforementioned combination of Anvari and Schilling patents to cancel the multi-path echo. The benefit is that Anvari's patent deals with space diversity system to combat multipath fading (Col. 1, line 64; Col. 2, line 1), and by incorporating the multi-path echo canceling feature, the diversity system would provide cleaner signal. As a result, the signal quality of the system is improved.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 703-306-5536. The examiner can normally be reached on 5/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dac V. Ha
Examiner
Art Unit 2634



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